CLAIM AMENDMENTS:

Claim 1 (Currently Amended): A front-opening unified pod auto-loading structure adapted to load ~~in~~ a FOUP (front-opening unified pod), comprising:

a machine base, ~~said machine base comprising~~ having a backboard with an upper access, a table disposed at a ~~on the~~ middle of said ~~backward~~ backboard, and a base disposed at a bottom ~~side~~ of said backboard~~, said backboard having an access on a upper side of said backboard~~;

a ~~carriage~~ carrier supported by ~~on~~ said table and adapted to carry said FOUP, said ~~carriage~~ carrier having an elongated opening close by the backboard and a detecting pin close by a center thereof for detecting if the FOUP is positioned accurately ~~hole through top and bottom sidewalls thereof~~;

a detector mounted on a back of said backboard above said access and adapted to detect protrusive wafers in the FOUP on said carrier;

a sliding control mechanism mounted on said table to support said ~~carriage~~ carrier and ~~controlled to move said carriage~~ control movement of said carrier toward or away from said access;

a ~~clamp mechanism mounted on the bottom sidewall of~~ latch below said ~~carriage~~ carrier, ~~said clamp mechanism comprising~~ having a rail fixedly fastened ~~to the~~ on a bottom ~~sidewall~~ of said ~~carriage~~ carrier, a ~~screw~~ threaded rod disposed in parallel to the rail of said ~~clamp~~ latch ~~mechanism,~~ a ~~slide~~ sliding pad threaded onto the ~~screw~~ threaded rod of said ~~clamp mechanism~~ latch and adapted to ~~move~~ slide along the rail of said latch ~~clamp mechanism upon rotary motion of the screw rod of said clamp mechanism~~, a motor adapted to rotate the ~~screw~~ threaded rod of said ~~clamp~~

~~mechanism~~ latch clockwise/counter-clockwise so as to make the sliding pad slide, and a ~~clamp~~ locking plate fixedly mounted on the ~~slide~~ sliding pad of said latch ~~clamp mechanism~~ and adapted to latch the FOUP on the carrier y inserting ~~inserted~~ through the elongated ~~hole~~ opening of said ~~carriage~~ carrier and ~~adapted to be moved~~ moving with the sliding ~~slide~~ pad of said ~~clamp mechanism~~ latch to a retaining portion of the carrier ~~clamp the FOUP being carried on said carriage~~;

a horizontal shifting mechanism, ~~said horizontal shifting mechanism comprising~~ having a rail ~~means~~ fixedly mounted on the base of said machine base, a horizontal ~~screw~~ threaded rod disposed in parallel to the rail ~~means~~ of said horizontal shifting mechanism, a platform threaded onto the ~~screw~~ threaded rod of said horizontal shifting mechanism, and a motor to drive and control the platform to move horizontally along the rail of said horizontal shifting mechanism when rotating ~~controlled to rotate~~ the ~~screw~~ threaded rod of said horizontal shifting mechanism clockwise/counter-clockwise, thereby moving ~~for causing~~ said platform ~~to be moved~~ horizontally along the rail ~~means~~ of said horizontal shifting mechanism toward/away from the backboard of said machine base; and

a lifting mechanism, ~~said lifting mechanism comprising~~ having a motor and a ~~screw~~ threaded rod and ~~slide~~ slider set vertically mounted on the platform of said horizontal shifting mechanism, said ~~screw~~ threaded rod and ~~slide~~ slider set ~~comprising~~ having a vertical rail, a ~~screw~~ threaded rod longitudinally mounted in said vertical rail, and a ~~slide~~ sliding pad threaded onto the ~~screw~~ threaded rod of said lifting mechanism and moved along said vertical rail upon ~~rotary motion~~ rotation of the ~~screw~~ threaded rod of said lifting mechanism.

Claim 2 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, ~~wherein~~ further comprising ~~a cover close/open control mechanism~~ headstock gear moved with the ~~slide~~ sliding pad of said lifting mechanism and controlled to close/open ~~the~~ a cover of the FOUP ~~being carried~~ on said ~~carriage~~ carrier.

Claim 3 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 2, wherein said ~~cover close/open control mechanism~~ headstock gear comprises:

a gate ~~fitting and adapted~~ to ~~be moved~~ move in and out of the access of said backboard of said machine base, said gate having two ~~through holes~~ through-hole portions;

two racks respectively fixedly fastened ~~to~~ on a ~~back sidewall~~ surface of said gate that does not contact the FOUP;~~,~~

two support arms respectively extended from said racks and connected to the ~~slide~~ sliding pad of said lifting mechanism; and

a driving unit mounted above the two racks ~~on a back sidewall of said gate~~ and controlled to close/open the cover of the ~~front opening unified pod being carried~~ FOUP on said ~~carriage~~ carrier, said driving unit ~~comprising~~ having a transmission shaft, a motor controlled to rotate said transmission shaft, two rotary bolts respectively coupled to said transmission shaft and inserted through the ~~through holes~~ through-hole portions of said gate ~~and adapted~~ for engaging into ~~the locating holes~~ locking-hole portions

formed in the cover of the FOUP ~~for turning by~~ and rotating with said transmission shaft to thus close/open the cover of the FOUP ~~being carried~~ on said ~~carriage~~ carrier.

Claim 4 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said sliding control mechanism ~~comprises~~ has a rail ~~means~~, a ~~screw~~ threaded rod disposed in parallel to the rail ~~means~~ of said ~~shifting~~ sliding control mechanism, ~~slide means~~ a sliding pad threaded onto the ~~screw~~ threaded rod of said ~~shifting~~ sliding control mechanism and fastened to a bottom sidewall of said ~~carriage~~ carrier and adapted to move said ~~carriage~~ carrier along the rail ~~means~~ of said sliding control mechanism upon ~~rotary motion~~ rotation of the ~~screw~~ threaded rod of said sliding control mechanism, and a motor controlled to rotate the ~~screw~~ threaded rod of said sliding control mechanism.

Claim 5 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said ~~carriage further comprises an escape hole~~ carrier has a round opening; further comprising a locking bolt inserted in the round opening and being driven by~~,~~ a motor ~~fixedly mounted on a bottom sidewall thereof, and a locking bolt inserted through said escape hole and coupled to the motor at said carriage and rotated by the motor at said carriage~~ to thus lock the FOUP on said ~~carriage~~ carrier.

Claim 6 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said ~~carriage~~ carrier has ~~comprises~~ has a

plurality of positioning rods ~~pins adapted~~ for engaging into respective positioning grooves on the FOUP ~~carried thereon~~ to hold the FOUP in position.

Claim 7 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said ~~carriage~~ carrier ~~further comprises~~ has a plurality of ~~detection~~ detecting pins ~~adapted~~ for detecting a manufacturing process stage.

Claim 8 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said ~~carriage~~ carrier ~~further comprises~~ has a plurality of ~~detection~~ detecting pins ~~adapted~~ for detecting a ~~the~~ type of the FOUP ~~being carried~~ thereon.

Claim 9 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said backboard of said machine base ~~comprises~~ has two parallel sliding slots longitudinally extended below said table.

Claim 10 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said backboard ~~comprises~~ has a ~~packing member~~ gasket mounted ~~around~~ on ~~the periphery~~ edges of said access ~~at a front side~~ facing the FOUP.

Claim 11 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 3, wherein said gate ~~comprises~~ has a ~~packing member~~ gasket mounted ~~around~~ on ~~the periphery~~ edges of a ~~front side thereof~~ surface thereof that does not contact the FOUP.

Claim 12 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim ~~1~~ 3, wherein said gate ~~further comprises~~ has a plurality of positioning pins ~~adapted~~ to engage respective ~~recessed~~ positioning ~~holes~~ recesses on the cover of the FOUP ~~being carried~~ on said ~~carriage~~ carrier.

Claim 13 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said ~~clamp~~ locking plate of said ~~clamp~~ latch ~~mechanism comprises~~ has at least one roller disposed at ~~a~~ top ~~side~~ thereof.

Claim 14 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, wherein said backboard of said machine base ~~further comprises~~ has two ~~guide holes~~ guide-hole portions, and said vertical rail of said lifting mechanism ~~comprises~~ has two guide rods backwardly extended ~~from a back sidewall thereof and~~ to be respectively inserted through the ~~guide holes~~ guide-hole portions of said backboard of said machine base ~~and adapted to~~ for ~~guide~~ guiding a horizontal movement of said lifting mechanism with said horizontal shifting mechanism.

Claim 15 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim 1, ~~wherein~~ further ~~comprises~~ comprising limit ~~switch means adapted~~ switches to respectively control ~~forward/backward turning~~ clockwise and counter-clockwise rotation ~~operation~~ of the motors of said ~~clamp mechanism~~ latch, said horizontal shifting mechanism and said lifting mechanism.

Claim 16 (Currently Amended): The front-opening unified pod auto-loading structure as claimed in claim ~~1~~ 3, wherein the head stock gear has ~~further comprising detector means~~ detectors mounted on top of said gate ~~at a top side~~ and adapted to detect ~~the~~ a wafer number and ~~positioning of wafers~~ position in the FOUP ~~being carried~~ on said ~~carriage~~ carrier.

Claim 17 (Canceled).